FLTSN-PXXXP100 | PASSIVE TEMPERATURE PROBE

Mounting and operating instructions

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SAFETY AND PRECAUTIONS

Read all the information in this manual, in the datasheet and in the Modbus Register Map before working with the product. For personal and equipment safety and for optimum product performance, make sure you fully understand the content before installing, using or servicing this product.

For safety and licensing (CE) reasons, unauthorised conversions and / or modifications of the product are inadmissible.

The product should not be exposed to abnormal conditions, such as extreme temperatures, direct sunlight or vibrations. Long-term exposure to chemical vapors in high concentration can affect the product performance. Make sure the work environment is as dry as possible and avoid condensation.

All installations must comply with local health and safety regulations and local electrical standards and approved codes. This product should only be installed by an engineer or a technician with expert knowledge of the product and safety precautions.

Avoid contact with energised electrical parts. Always disconnect the power supply before connecting, servicing or repairing the product.

Always check that you are connecting the correct power supply to the product and use wires of the correct characteristics and cross-section. Make sure all screws and nuts are properly tightened and fuses (if any) are in place.

Consideration should be given to recycling the equipment and packaging. These should be disposed of in accordance with local and national laws and regulations.

If there are questions that are not answered, contact your technical support or consult a professional.

PRODUCT DESCRIPTION

FLTSN-PXXXP100 are passive temperature probes (Resistance Temperature Detectors), which function by measuring the change in electrical resistance of a material as its temperature changes. They have a positive linear temperature coefficient of resistance: when the measured temperature rises, the resistance rises as well.

The passive temperature probes FLTSN-PXXXP100 provide the following benefits:

- Stability: Reliable temperature measurements due to the platinum sensor element used.
- Robustness: The sensing element is coated with waterproof acrylic coating and enclosed in ABS (Acrylonitrile Butadiene Styrene) plastic tube.
- User-Friendliness: Simpler connection with two cores — Line and Neutral.

With their simplicity and practicality, the passive temperature probes FLTSN-PXXXP100 can be implemented effortlessly in various HVAC applications.

ARTICLE CODES

Article code	Measurement current [mA]
FLTSN-P500P100	0.1—0.4
FLTSN-P1K0P100	0.1—0.25

INTENDED AREA OF USE

- Temperature measurement in HVAC applications
- Indoor and outdoor applications

TECHNICAL DATA

- General characteristics
  - Acrylic coated sensing element in a plastic tube
  - Positive linear temperature coefficient
  - Tinned connections
  - Cable sheath: white
- Enclosure
  - Material of plastic tube: ABS (Acrylonitrile Butadiene Styrene) plastic
  - Colour: Black
  - Ingress protection: IP65
- Sensing element characteristics
  - Standardised characteristics according to IEC 60751
  - Short reaction times down to t0.9 ≤ 5 s (flowing air, 3.0 m/s)
  - Outstanding stability of temperature characteristic

STANDARDS

CE

- Low Voltage Directive 2014/35/EU
- Electromagnetic Compatibility (EMC) Directive 2014/30/EU
- Commission Delegated Directive (EU) 2015/863 (RoHs 3) of 31 March 2015 amending Annex II to Directive 2011/65/EU of the European Parliament and of the Council as regards the list of restricted substances
- WEEE Directive 2012/19/EU

MOUNTING & OPERATING INSTRUCTIONS IN STEPS

Before you start mounting the unit, read carefully **"Safety and Precautions"** and make sure the following recommendations are met:

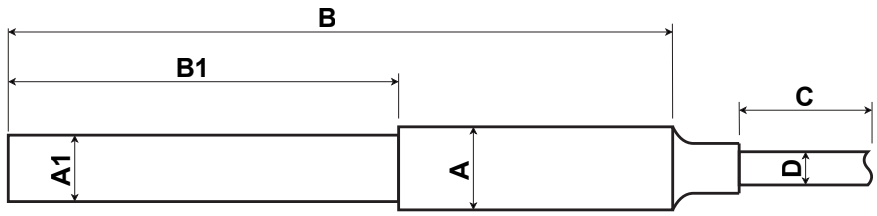
- When the sensor is used to measure ambient temperature, it should not be installed near diffusers, vents, windows and other sources of airflow since they can affect the accuracy of the sensor measurements. Make sure there is distance of at least 0,3—0,5 m between the sensor and the source of airflow.
- The sensor should be mounted at least 0,5—1 m away from heat sources such as direct sunlight, radiators, machinery, chimney walls or walls concealing hot-water pipes.
- The sensor should not be installed where vibrations and/or electromagnetic interference occur.

Follow these steps:

- **Wall mounting** (ambient temperature monitoring):

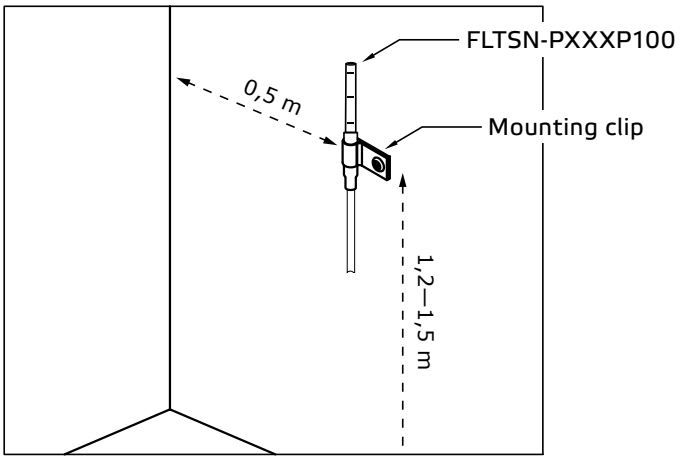
1. Mount the sensor at a height of 1,2—1,5 m from the ground level while adhering to the mounting dimensions in **Fig. 1**.
2. Make sure to maintain distance of at least 0.5 m from any adjacent wall.
3. Secure the sensor using a mounting clip or a holder — see **Fig. 2**. Please note that the size of the drilling hole depends on the specific mounting clip or holder used.
4. Switch off the power supply and do the wiring.

Fig. 1 Mounting dimensions



Article code	A1	A	B1	B	C	D
FLTSN-PXXXP100	8 mm	9 mm	53 ± 2 mm	89 mm	1000 mm	4 mm

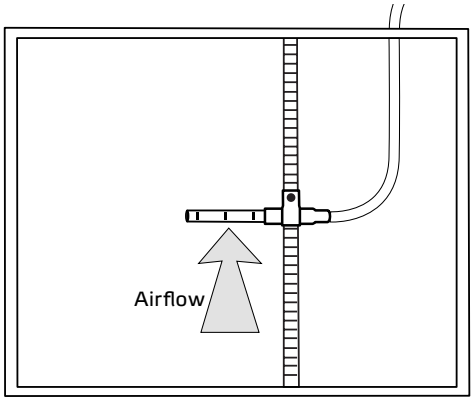
Fig. 2 Wall mounting



- **Duct mounting**

1. Select a straight section of the duct. Avoid installing near elbows and the areas where the duct size changes. Do not install the sensor near coils, dampers, fans, grilles. Mind the mounting dimensions of the sensor before installing — see **Fig 1**.
2. Drill a hole between Ø 8.5 and Ø 9.5 mm.
3. Insert the sensor inside the duct. Position the probe in the centre of the duct or near it. The probe can be fixed to a flexible duct hanger by the means of a tube clamp or wire tie. Make sure that the probe openings are facing the airflow and the probe is not touching the duct surface — see **Fig. 3**.
4. Seal the hole with additional means (e.g. duct tape or adhesive material) to prevent air leakage and to secure the sensor. If you are using a cable gland, note that the hole size may differ.
5. Switch off the power supply and do the wiring.

Fig. 3 Duct mounting

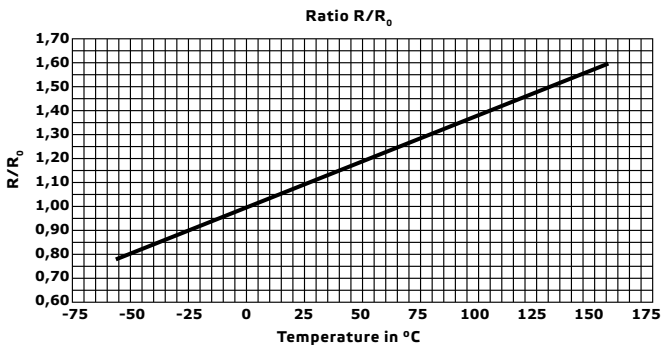


WIRING AND CONNECTIONS

Connections	
Maximum cable cross-section	0,5 mm²
Cable characteristics	2-pole stranded wire, unshielded, tinned connections

OPERATIONAL DIAGRAMS

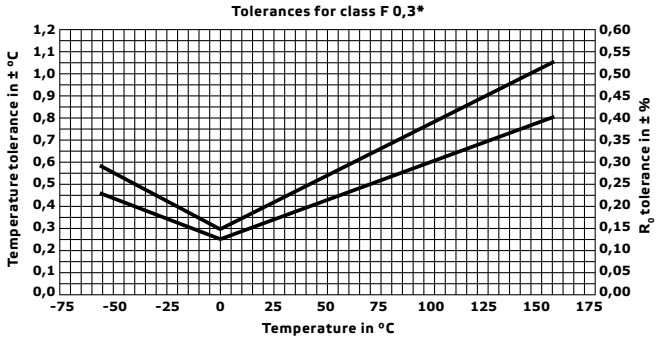
Resistance values



The diagram above shows how the resistance of a platinum RTD changes with temperature without referring to a specific RTD. It is normalised so that at 0 °C, the ratio (R/R_0) is 1. The advantage of this diagram is that all RTDs (PT500, PT1000, etc.) lie on the same curve or in other words, the diagram is applicable for all of the

devices from the FLTSN-PXXXP100 series. The curve is described by the following formula, where T_0 is 0 °C: $R/R_0 = 1 + 3850 \cdot (T - T_0)$.
To use it, multiply $(1 + 3850 \cdot (T - T_0))$ — the normalised value at specific temperature — by R_0 — the nominal resistance at 0 °C — to get the real resistance.

Tolerance values



The diagram above shows the temperature and resistance tolerances for RTDs at different temperatures.

**Class F 0,3 refers to measuring resistor classes (specified by IEC 60751), which define how accurate temperature measurements can be in accordance with the actual temperature that is being measured. Or in other words, the classes show the permissible difference between those values. In class F 0,3, the permissible deviation is ± 0.3 °C at 0 °C.*

TROUBLESHOOTING

In case of faulty operation, please check if:

- All connections are correct.
- The mounting recommendations have been fulfilled.
- The device to which the sensor is connected is functioning correctly.

VERIFICATION OF INSTALLATION

If your unit does not function as expected, please check the connections or refer to the **"Troubleshooting"** section.

FREQUENTLY ASKED QUESTIONS (FAQs)

Can the sensor be submerged into water?

This sensor is suitable for both indoor and outdoor applications due to its high protection rating — IP65. The enclosure of the sensor ensures that the PCB components are completely protected from dust ingress and water jets from any direction. However, the sensor is not designed to function underwater.

Can the cable of the sensor be extended?

FLTSN-PXXXP100 probes are passive resistance temperature detectors that work by sensing temperature-related changes in their electrical resistance. As the temperature goes up, their resistance increases proportionally. Technically, cable extension is possible, however, it should be taken into account that the longer the cable, the less accurate sensor measurements are since the resistance of the cable influences the reading.

Is the sensor easy to connect?

Thanks to its compact design and integrated 2-wire cable, the FLTSN-PXXXP100 sensor ensures effortless connection. The unit does not require separate power

supply and can be used in different applications. Typically, the sensor is connected to an external device (e.g. fan speed controller), which sends an excitation current to the sensor, measures the voltage drop across it, calculates the resistance and converts it into a temperature reading.

TRANSPORT AND STORAGE

Avoid shocks and extreme conditions; stock in original packaging.

WARRANTY AND RESTRICTIONS

Two years from the delivery date against defects in manufacturing. Any modifications or alterations to the product after the production date relieve the manufacturer of any responsibilities. The manufacturer bears no responsibility for any misprints or mistakes in this data.

MAINTENANCE

In normal conditions, this product is maintenance-free. If soiled, clean with a dry or damp cloth. In case of heavy pollution, clean with a non-aggressive product. In these circumstances, the unit should be disconnected from the supply. Pay attention that no fluids enter the unit. Only reconnect it to the supply when it is completely dry.